

Additions to the Thysanoptera from the Island of Hawaii

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(Presented at the meeting of November 19, 1945)

This paper adds 25 species of thrips to the 29 previously listed by Sakimura and Krauss and by Bianchi (Proc. Haw. Ent. Soc., 10: 1945) from the island of Hawaii. It includes a miscellany of unpublished records accumulated over a period of years in the collections of the writer and others, but is based mainly on the results of extensive and careful collecting which Mr. Clifton J. Davis did during 1945 and the latter months of 1944.

Stationed at Kilauea as park ranger, Mr. Davis is taking excellent advantage of the opportunities afforded by his situation, and his collections and careful investigations have already added greatly to our knowledge of all the orders of insects on the Big Island. In the Thysanoptera his material comprises a great many lots of the more common species, with careful notations as to habits and host plants; but for the sake of brevity only those species are mentioned here which have not been previously recorded from the island.

One of the species is new to the Territory; three are new to science and are now named and described for the first time. With these, the Thysanoptera from the island of Hawaii are run up to 51 specifically determined species, not including several species listed by Sakimura and Krauss only under the generic name, nor two or three species which are represented in my own collection by material too meager to warrant description at present. Since our native thrips appear to be characterized by secretiveness and scarcity, it is very probable that other species, possibly many, remain to be found.

In the following list the initials H.N.P., C.J.D., and F.A.B. refer respectively to the general locality, Hawaii National Park; and to the collectors, Clifton J. Davis and F. A. Bianchi.

TUBULIFERA

Haplothrips davisi sp. nov. (Plate XXIX, fig. D; Plate XXX, fig. D)

Brachypterous female: Length, not including inter-segmental membranes, about 1.3 mm. Color by transmitted light chestnut brown; extreme base of antennal segment 3, all tarsi and extreme ends of tibiae, lighter. Subhypodermal pigment reddish. Striation very fine, visible only in clear specimens, composed of transverse anastomosing lines, more apparent on dorsum of head, mesoscutum, first abdominal tergite, base of tube.

Head about 1.1 as long as wide, widest in the middle; the cheeks weakly arched to caudal fifth or sixth, which is very slightly narrowed. Vertex declivous to base of antennae, weakly or not at all convex in front. Eyes about one fourth as long as head and about one fourth as wide; dorsally almost semicircular on the inner outline and ventrally weakly, roundly produced at the inner caudal angle. Facets large and regular in size, only about 4 on the outer outline of the eye, a few microsetae among them. Ocelli vestigial or entirely absent. Three or four very minute setae around inner outline of eyes and two on vertex; a few others on cheeks and dorsum of head. Postocular spines more than 1.5 as long as the eyes and set about half the eye length from their posterior margins, a little less than the same distance from the cheeks. Mouth cone about two thirds as long as head, conical, rounded at end; labrum dark-tipped and slightly surpassing labium; maxillary palpi long and thick, about half as long as mouth cone.

Antennae about twice as long as head; the inter-antennal costa short, straight across end and about a fifth as wide as basal antennal segments. Antennal segments as illustrated; the third, fourth, and fifth with wrinkle ventrally near end, upon which are inserted setae somewhat stronger and longer than the others of the segment. Two lateral sense cones on segments 3 to 6 and one dorsad on segment 7; those on segment 4 strong and blunt at end, those on other segments somewhat thinner and more acute. Porus on segment 2 conspicuous. Antennal hairs pale but in general strong and conspicuous.

Prothorax about .9 as long as head and not including coxae about 1.5 as wide as head; the fore and hind margins weakly arched; the sides more strongly divergent from anterior angles to middle than from middle to posterior angles; the median suture short, wavy. The usual major setae pointed, except anteroangulars and anteromarginals which are sometimes blunt or weakly expanded at end; the pair at each posterior angle longest, about equal to one another and to postoculars; midlaterals, anteromarginals and anteroangulars successively shorter; coxals subequal to midlaterals and inserted on the ventral surface of coxae.

Pterothorax subquadrate, about .266 mm. long on midventral line (including first abdominal sternite) and about .254 mm. across anterior angles, very slightly tapered caudally. Fore tibiae and fore femora somewhat thicker than others; fore tarsi armed with the usual claw on the outer surface and a minute tooth on the inner surface of the basal segment.

Abdomen long and heavy, widening gradually to segment 6; major setae light brown, long and pointed; those on segment 9 a little shorter than terminals and 1.5 as long as tube. Tube about .75 as long as head; nearly twice as wide at base as at end and tapering evenly from basal fifth; paired pori conspicuous and on about the distal third of dorsal surface.

Measurements of type (brachypterous female treated with KOH) in mm.: Head length .147; head width across cheeks .143; eye length .036; prothorax length .131; prothorax width including coxae .254; pterothorax length on midventral line .266; pterothorax width on anterior angles .254; abdomen width on segment 6, .299; tube length .110; tube width at base .061; tube width at end .032; longest setae on segment 9, .164; longest setae on tube .184; coxals .164; epimerals .069; posteroangulars .069; midlaterals .061; anteroangulars .032; anteromarginals .045; postoculars .069.

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.028	.041	.041	.041	.041	.041	.041	.028	.302

Brachypterous male: Colored like female; slightly smaller, about 1.12 mm. long. Abdomen equal in width to segment 6, thence tapered caudally. Posteroangular setae on segment 9 reduced (about .036 mm. long), stout and stiff.

Measurements of male allotype (brachypterous; treated with KOH) in mm.: Body length 1.12; head length .123; head width across cheeks .131; prothorax length .102; prothorax width including coxae .221; pterothorax

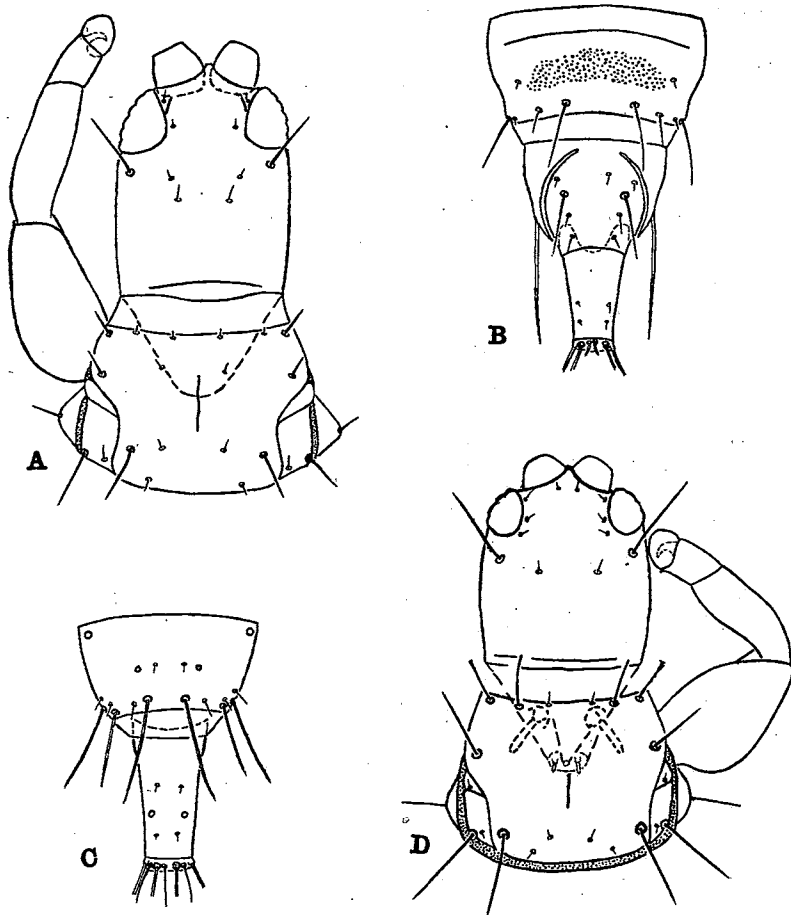


PLATE XXIX

A—*Haplothrips rosai* sp. nov. Head, prothorax and left fore leg of brachypterous female, not showing all minor setae.

B—*Haplothrips rosai* sp. nov. Ventral view of abdominal segments 8, 9, and 10 of brachypterous male, showing median granule depression on 8th ventrite, terminal bristles abbreviated.

C—*Haplothrips rosai* sp. nov. Dorsal view of abdominal segments 9 and 10 of brachypterous female, with terminal bristles abbreviated.

D—*Haplothrips davisii* sp. nov. Head, prothorax and right fore leg of brachypterous female, not showing all minor setae.

length including first abdominal sternite .205; pterothorax width across anterior angles .213; abdomen width on segment 6, .209; tube length .090; tube width at base .053; tube width at end .028.

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.028	.041	.036	.041	.041	.041	.041	.028	.297

Described from the following material: One female paratype from *Metrosideros* leaves, Kilauea, April 14, 1944, N.L.H. Krauss, coll.; one female paratype from *Acacia koa* branches, H.N.P., March 10, 1945, C.J.D., coll.; male allotype from *Acacia koa* branches, Mauna Loa truck trail, H.N.P., 6,500 ft. elev., April 20, 1945, C.J.D., coll.; one male paratype from dead branch of *Metrosideros*, Makaopuhi, H.N.P., 2,870 ft. elev., July 6, 1945, C.J.D., coll.; two female and two male paratypes on old dead branches of *Pipturus*, Thurston lava tube, H.N.P., July 16, 1945, C.J.D., coll.; three female and four male paratypes on old dead branches of *Sophora chrysophylla*, Mauna Loa truck trail, H.N.P., 5,500 ft. elev., August 24, 1945, C.J.D., coll.; female holotype and one female paratype from dead branch of *Acacia koa*, Mauna Loa truck trail, H.N.P., 6,500 ft. elev., August 25, 1945, C.J.D., coll.

In addition to the type series, I have a number of specimens collected by Mr. Davis on later dates.

Davisi fits well in the *Haplothrips* and, like most species of the genus, it is a difficult one to characterize. However, from other species found in Hawaii it can be separated easily by its long pointed setae, of which only the anteroangulars and anteromarginals on the pronotum are likely to be, but are not always, slightly expanded at the end. It is not without hesitation that I describe it from material which does not include forms possessing functional wings and ocelli, but I feel justified because the species appears to be a common one in the Kilauea region and our collections indicate that it is very probably a prevalingly brachypterous species of which the macrop-terous forms, if such ever occur, may never be found.

I take pleasure in naming the species after Mr. Clifton J. Davis whose collaboration has made possible the writing of this paper and who has in many ways added to the pleasure of my visits to Hawaii.

***Haplothrips rosai* sp. nov.** (Plate XXIX, figs. A, B, C; Plate XXX, Fig. E)

Brachypterous female: Length not including inter-segmental membranes about 1.43 mm. Color by transmitted light dark chestnut brown; all tarsi light yellowish brown and fore tibiae shading to same color at end. Eyes black; subhypodermal pigment red. Striation fine, composed of transverse anastomosing lines, more apparent basally and laterally on dorsum of head, on abdominal tergite 1, and dorsally at base of tube. All spines clear brownish yellow.

Head about 1.14 as long as wide; the cheeks normally roundly, weakly constricted back of eyes and thence practically straight to base of head, but in some specimens divergent caudally, causing the head to appear widest at

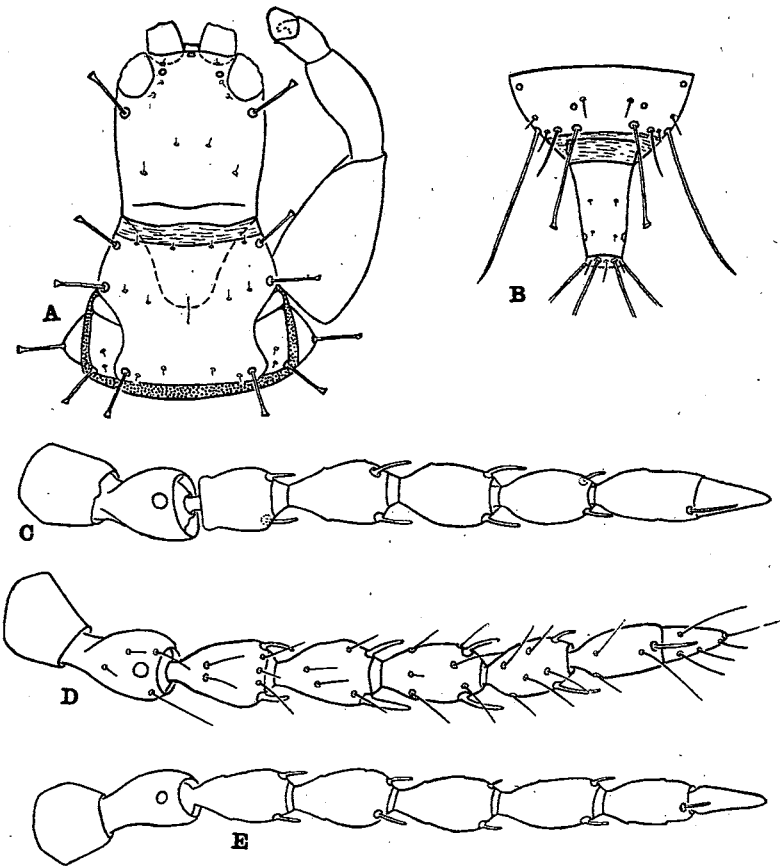


PLATE XXX

A—*Karnyothrips doliicornis* sp. nov. Head, prothorax and right fore leg of brachypterous female, not showing all minor setae.

B—*Karnyothrips doliicornis* sp. nov. Dorsal view of abdominal segments 9 and 10 of brachypterous female, with terminal bristles abbreviated.

C—*Karnyothrips doliicornis* sp. nov. Dorsal view of left antenna of brachypterous female, with all setae omitted.

D—*Haplothrips davisii* sp. nov. Dorsal view of left antenna of brachypterous female.

E—*Haplothrips rosai* sp. nov. Dorsal view of right antenna of brachypterous female, with all setae omitted.

base. Vertex slightly depressed next to eyes; weakly convex dorsally and in front. Eyes large, between one quarter and one third as long as head and nearly one third as wide; dorsally the inner and hind margins forming a distinct obtuse angle; ventrally weakly, roundly produced at the inner caudal angle. Facets small and regular, about 7 occupying the outer outline of eye. Ocelli absent. A few minute setae around inner outline of eye and a few others on vertex, cheeks, and dorsum. Postocular setae about 1.3 as long as eyes and set about .3 the eye length from posterior margin, somewhat closer to the cheek. Mouth cone about .45 as long as head; evenly conical; rounded at end; labrum dark-tipped and just short of labial margin; maxillary palpi long and thick.

Antennae about twice as long as head; inter-antennal costa short, straight across end, only a fourth or fifth as wide as the basal antennal segments. Antennal segments as illustrated; segment 8 constricted at base and narrower than segment 7; segments 3, 4, 5, 6 each with a weak, blunt sense cone on either side; segment 7 with a longer, thinner cone dorsally. Porus on segment 2 conspicuous, about .115 mm. in diameter, placed near distal end of segment. Antennal hairs pale, rather weak.

Prothorax about .8 as long as head and not including coxae about 1.4 as wide; fore and hind margins weakly arched; sides weakly divergent to middle and thence parallel to posterior angles. All setae pointed; anteroangulars and midlaterals about equal to each other, and to coxals, about .5 as long as postoculars, epimerals and posteroangulars; anteromarginals minute. A short wavy median groove is generally apparent.

Pterothorax subquadrate, very slightly tapered caudally, about .205 mm. long on midventral line including first abdominal sternite, about .225 mm. across anterior angles. Wings reduced to short pads. Fore legs a little shorter and thicker than others; fore tarsi without tooth on inner surface, but all tarsi with usual claw on outer surface.

Abdomen long and heavy, widest on segments 4 and 5 which are about equal. Posteroangular setae greatly reduced, sometimes minute, on segments 1 to 7; about half as long as the segment on segment 8; about equal to the segment on segment 9. Terminals about 1.4 as long as tube. Tube somewhat less than twice as long as wide at base and about twice as wide at base as at end, tapering evenly from basal fifth to end and about .7 as long as head. Paired pori about .004 mm. in diameter, placed on about distal fourth.

Measurements of female holotype (brachypterous; treated with KOH) in mm.: Head length .164; head width across cheeks .143; eye length .053; prothorax length .139; prothorax width not including coxae .205; pterothorax length including first abdominal sternite .205; pterothorax width at anterior angles .225; abdomen width at segment 5, .315; tube length .110; tube width at base .061; tube width at end .032; postocular setae .041; anteroangular setae on prothorax .020; midlateral setae .016 (paratype); epimeral setae .041; posteroangular .041; coxal .020; posteroangular on abdominal segment 9, .065; median on abdominal segment 9, .077; terminals on tube .123 (approx.).

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.024	.045	.045	.041	.045	.045	.036	.028	.309

Brachypterous male: Smaller than female, only 1.07 mm. long; of same color and similar in general appearance but with prothorax and tube shorter in relation to head. Distinguished at once from the males of all other *Haplothrips* by a large, more or less reniform, granulose depression medianly located on the 8th ventrite.

Measurements of male allotype (brachypterous; treated with KOH) in mm.: Head length .139; head width .123; prothorax length .102; prothorax width .164; pterothorax length .143; pterothorax width (approx.) .205; abdomen width (segment 5) .217; tube length .082; tube width at base .049; tube width at end .028; postocular setae .041; anteroangulars on prothorax .024; epimerals .041; posteroangulars .041; posteroangulars on segment 9,

.036; medians on segment 9, .065; longest terminals (sides) on tube .123; coxals .016.

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.024	.036	.036	.036	.036	.041	.032	.028	.269

Described from the following material: One female paratype from *Metrosideros* leaves, Kilauea, April 14, 1944, N.L.H. Krauss, coll.; female holotype from dead branch of *Metrosideros*, Makaopuhi, H.N.P., 2,870 ft. elev., July 6, 1945, C.J.D., coll.; one female paratype from *Sadleria* stipes, Makaopuhi, H.N.P., 2,870 ft. elev., July 19, 1945, C.J.D., coll.; male paratype and allotype from leaves of *Vaccinium reticulatum*, H.N.P., March 14, 1945, C.J.D., coll.; one male paratype from dead branch of *Myrsine lessertiana*, Makaopuhi, H.N.P., 2,870 ft. elev., July 16, 1945, C.J.D., coll.

With the heavy abdomen and the caudally widened head, *rosai* does not have the habitus typical of most *Haplothrips* known to me, and perhaps under a more natural classification of the Tubulifera than we now possess the species would not fall into that genus. As it is diagnosed at present, however, the scope of *Haplothrips* does comprehend the whole combination of characters displayed by the new species, which no other genus will quite do.

The granulose depression is plain and fully developed in all male specimens and, to judge by appearances, must serve the same function as the elliptical depressions found on the sternites of many male Terebrantia. I cannot find in the literature any other mention of such an organ in the Tubulifera; but possibly it has been overlooked, as could easily happen in the case of the usual dorso-ventral mounts.

I dedicate this species to Mr. Joseph S. Rosa, who for many years has been my helpful colleague and valued friend.

Haplothrips (Hindsiana) sakimurai Moulton.

One female in dead twigs of *Myoporum sandwicense*, Mauna Loa truck trail, H.N.P., 4,200 ft. elev., July 17, 1945, C.J.D. and F.A.B., colls.

Karnyothrips melaleuca (Bagnall)

One female on dead stipes of *Cibotium chamissoi*, north of sulphur banks, H.N.P., 4,050 ft. elev., July 15, 1945, C.J.D., coll.; two females beaten off dead branches of *Heimerliodendron brunonianum* (Endl.) Skottsb., Kipuka Pauuli, H.N.P., October 11, 1945, C.J.D., coll.; one female beaten off old branches of *Pittosporum convertiflorum* Gray, Pauahi Crater, H.N.P., October 22, 1945, C.J.D., coll.

Karnyothrips flavipes (Jones)

Three males in old branches of *Acacia koa*, Six Tanks, H.N.P., 4,600 ft. elev., November 1944, C.J.D., coll.; two females on dead branches of ohia lehua, Pauahi Crater, H.N.P., December 17, 1944,

C.J.D., coll.; six females on dead branches of *Mezoneurum kauaiense*, east of Puu Waawaa Ranch road, May 26, 1945, C.J.D., coll.; one female in dead twigs of *Myoporum sandwicense*, truck trail, H.N.P., July 17, 1945, C.J.D. and F.A.B., colls.; one female on *Macaranga*, Hilo, February 24, 1945, William C. Look, coll. (this is the specimen referred to as *Haplothrips* sp. by Sakimura in the Proc. Haw. Ent. Soc., vol. 12: 331); two females on old branches of *Coprosma* sp., Ohaikea, 4,200 ft. elev., H.N.P., October 13, 1945, C.J.D., coll.; four females beaten off dead branches of *Myrsine sandwicensis* A. DC., Alealea Crater, H.N.P., October 30, 1945, C.J.D., coll.; four females beaten off dead branches of *Myrsine lessertiana* A. DC., Makaopuhi, November 18, 1945, C.J.D., coll.

***Karnyothrips doliicornis* sp. nov. (Plate XXX, figs. A, B, C)**

Brachypterous female: Body length, partly distended, 1.44 mm. Color by transmitted light chestnut brown; middle of tube, tarsi, tibiae, particularly at base and apex, lighter; antennal segments 2, 3, sometimes also base of 4, pale yellowish brown; ocellar crescents, sub-hypodermal pigment red. Striation fine, visible only in cleared specimens, transversely subreticulate on head and mesoscutum, longitudinally reticulate on sides of metanotum.

Head about 1.25 as long as wide; the sides almost straight and parallel from the eyes to about basal fourth, thence weakly and roundly constricted to base; vertex weakly concave next to eyes and weakly convex in middle. Each eye occupying a little less than a quarter head length and a little more than a quarter of head width; the inner dorsal outline irregularly rounded and the inner ventral outline forming an almost right angle; the outer contour protruding very slightly from the vertex and not at all from the cheek; the dorsal facets of same diameter as ocelli and the ventral facets somewhat larger. Ocelli widely separated but not touching inner margins of eyes; the anterior ocellus forwardly directed on declivity of vertex. Postocular spines about .2 longer than eyes, set nearly one third of the eye's length from its margin and about an equal distance from the cheek. One minute spine in front of each posterior ocellus and two on a longitudinal line behind; other very minute spines scattered over dorsum and sides of head. Mouth cone slightly less than half as long as rest of head, much narrower than head at base, broadly rounded at end; labrum blacktipped and not surpassing labium.

Antennae about twice as long as head, inserted a little caudad of vertex; the frontal costa less than half as wide as basal antennal segments, slightly projecting and weakly concave. Antennal segments as illustrated; 3 widened basally at right angles to the pedicel and more or less barrel-shaped above pedicel; 7 not pedicellate and broadly joined to 8. Sense cones weak, only a third or fourth as long as segments bearing them, tapering distally but not sharply pointed; two more or less lateral cones on segments 3 to 6 and one, longer and thinner than the others, on segment 7. Porus on segment 2 conspicuous, about .006 mm. in diameter. Antennal hairs pale, weak, inconspicuous.

Prothorax about .75 as long as head and not including coxae about .6 wider basally than head; the fore and hind margins only weakly arched; the sides more strongly divergent from anterior angles to middle than from middle to posterior angles. Median suture short, wavy. Excepting anterior marginals, all the usual major setae present; all, including prominent coxals, expanded apically, pale, sub-equal in length. Minor setae very small and inconspicuous. Pterothorax normal, about as wide as prothorax at prominent anterior angles and tapering slightly caudally, about .217 mm. long on the

midventral line. Legs rather short and stocky; fore femora slightly incrassate and fore tarsi inconspicuously armed on the basal segment with the usual outer claw and a small inner tooth which sometimes does not surpass the tarsal outline.

Abdomen long and heavy, nearly twice as long as rest of body, widening very gradually to segment seven, thence abruptly narrowed to base of tube. All major setae capitate excepting terminals on tube and laterals on segments 7 and 9. Tube twice as wide at base as at end and nearly twice as long as wide at base, considerably shorter than width of head; the sides parallel on basal fifth (inserted in segment 9) and thence evenly convergent; paired pori on sides of distal fifth; six long terminal setae little less than twice as long as tube.

Measurements of type (apterous female treated with caustic potash) in mm.:

Antennal segments:	1	2	3	4	5	6	7	8	Total
	.041	.045	.036	.045	.045	.036	.053	.032	.333

Body length 1.2; head length .17; head width across cheeks .13; eye length .045; eye width .032; prothorax length .123; prothorax width, including coxae, .254; pterothorax length on mid-dorsal line .184; pterothorax width on anterior angles .246; width of abdomen on segment 6, .266; tube length .106; tube width at base .061; tube width at end .028; postocular setae .049; anteroangulars .041; midlaterals .041; epimerals .049; posteroangulars .041; coxals .041; pointed laterals on segment 7, .102; pointed laterals on segment 9, .135; longest terminals on tube (laterals) .205 (approx.); proximal sub-basal on forewing .032; distal sub-basals on forewing .136.

Macropterous female: Similar to brachypterous form except in the possession of wings and large sigmoid setae paired on abdominal tergites 3 to 7. The forewings are clearly narrowed in the middle and faintly smoky, with the smokiness disappearing near the end. They possess 4 intercallary ciliae, and 3 capitate sub-basals of which the proximal is a trifle shorter than the other pair and the middle one is inserted slightly inward from the others.

Described from the following material, all collected by Mr. Davis: two brachypterous females from dead branches of *Metrosideros*, Makaopuhi, H.N.P., 2,870 ft. elev., July 6, 1945, type and paratype No. 1; one brachypterous female on living branch of *Metrosideros*, Puhinau Crater, H.N.P., October 12, 1944; one brachypterous female on living branch of *Sophora chrysophylla*, near Kipuka Ki, H.N.P., 4,500 ft. elev., December, 1944; one brachypterous female on *Sadleria stipes*, near Makaopuhi, H.N.P., 2,860 ft. elev., December, 1944, paratype No. 2; one macropterous female, host unrecorded, H.N.P., December 12, 1944, paratype No. 3.

In addition to the type series, I have two brachypterous females collected by Davis on *Myoporum sandwicense*, dead wood, at Keauhou Ranch, 4,200 ft. elev., July 23, 1945, and two brachypterous females beaten off dead branches of *Myrsine lessertiana* at Makao-puhi, H.N.P., on November 18, 1945.

The habitus of this new species is typical of the genus and it might be mistaken in Hawaii for *Karneyothrips flavipes* (Jones) if it were not for the very distinctive antennae and the inner tooth of the fore tarsus, which is much shorter in *dolicornis* and sometimes hardly surpasses the contour of the tarsus. To judge by the illus-

trated description, *Zygothrips pallidus* Hood has very similar antennae, but in other respects the two species are quite different.

Hoplothrips swezeyi Moulton

One male under bark of *Metrosideros*, Hiiaka Crater, H.N.P., December 17, 1944, C.J.D., coll.

Phloeothrips mauiensis Moulton

One male and two females on old branches of *Sophora chrysophylla*, Kipuka Ki, H.N.P., December 17, 1944, C.J.D., coll.; one female on old branch of *Pittosporum convertiflorum* Gray, Pauahi Crater, H.N.P., October 22, 1945, C.J.D., coll.

Macrophthalthothrips hawaiiensis Moulton

Four females in old branches of *Sophora chrysophylla*, Kipuka Ki, H.N.P., 4,500 ft. elev., November 6, 1944, C.J.D., coll.; two males and one female in old branches of *Acacia koa* near Six Tanks, H.N.P., November, 1944, C.J.D., coll.; one male and one female under bark of *Sapindus saponaria* Linn., H.N.P., January 31, 1945, C.J.D., coll.; one female in old branches of *Acacia koa*, H.N.P., February 10, 1945, C.J.D., coll.; one female on old branch of *Xylosma hawaiiensis* Seem. var. *hillebrandii* (Wawra) Sleumer, Kipuka Puulu, H.N.P., October 11, 1945, C.J.D., coll.; one male beaten off dead branches of *Perottetia sandwicensis* Gray, N.W. of Keauhou Ranch, October 19, 1945, C.J.D., coll.

Podothrips lucasseni (Kruger)

Many males and females on sugar cane, Honokaa, October 15, 1924, C. E. Pemberton, coll.

TEREBRANTIA

Chirothrips mexicanus Crawford

Five females by sweeping grass, Six Tanks, H.N.P., January 1, 1945, C.J.D., coll.

Chirothrips fulvus Moulton

One female beaten off dead leaves of *Styphelia tameiameia*, end of Mauna Loa truck trail, 6,500 ft. elev., H.N.P., October 12, 1945, C.J.D., coll.

Hercothrips fasciatus (Pergande)

Abundant on leaves and stems of *Argemone glauca* and of *Sonchus oleraceus*, near Naalehu, June 5, 1945, F.A.B., coll.

Hercinothrips femoralis (Reuter)

One female on grass, Six Tanks, H.N.P., January 31, 1944, C.J.D., coll.

Scirtothrips antennatus Moulton

Small colony, females and young, on leaves of *Plumeria*, Hono-

kaa, March 29, 1944, F.A.B., coll.; small colony on leaves of *Columbrina oppositifolia* Brongn., Puu Waawaa, 1,900 ft. elev., C.J.D., coll.

Anaphothrips swezeyi Moulton

Abundant on sugar cane and grass, Honokaa, October 19, 1924, C. E. Pemberton, coll.

Thrips saccharoni Moulton

Abundant on sugar cane, Honokaa, February 26, 1923, C. E. Pemberton, coll.

Merothrips morgani Hood (Proc. Ent. Soc. Wash., 14: 132, 1912)

One female beaten off dead branch of *Santalum paniculatum* Hook. & Arn., Kipuka Puauulu, H.N.P., October 11, 1945; five females and one male beaten off dead branches of *Heimerliodendron brunonianum* (Endl.) Skottsb., same date and locality as above; one female beaten off branches of *Urera sandwicensis* Weddell, same date and locality as above; two females and one male beaten off dead branches of *Perottetia sandwicensis* Gray, 1¼ miles N.W. of Keauhou Ranch, October 19, 1945; two females and one male beaten off dead branches of *Pittosporum convertiflorum* Gray, Pa-uahi Crater, H.N.P., October 22, 1945; all collected by Mr. Davis.

Perfect agreement of all these specimens with Hood's careful, illustrated description leaves no doubt of their identity. This wingless species was described from Illinois and Kentucky and its discovery in Hawaii, constituting a new record for the Territory, suggests that the species is probably more abundant and of wider range on the American continent than is shown by published records. It is improbable that such a species could have reached Hawaii from the eastern United States without also spreading its range to the west coast.

Comparison of Mr. Davis' specimens with a paratype of the winged *Merothrips hawaiiensis* Moulton (Proc. Haw. Ent. Soc., 9 [3]: 411, 1937) borrowed from the collection of the Pineapple Research Institute, Honolulu, shows a very close resemblance of the two species and indicates that they may be but the winged and the wingless forms of a single species. Until the two forms are collected together, however, or at least on the same island, their synonymy will remain doubtful.

Thrips (Isoneurothrips) australis Bagnall

One female from a flower of *Pittosporum undulatum* Vent., residential area, H.N.P., March 14, 1945, C.J.D., coll.

Thrips (Isoneurothrips) carteri Moulton

End of Mauna Loa truck trail and Kipuka Ki, H.N.P., at elevation of 6,400 and 4,200 ft. respectively, on several dates, C.J.D. and F.A.B., colls.

In contrast to other *Isoneurothrips*, which are mostly collected in flowers, colonies of this species are often found associated with a rust fungus very common on *Acacia koa*. The relationship of the two organisms has not been worked out, but cursory observations indicate that the thrips probably lay their eggs among the massed spores of the fungus—"the rust"—and that the larvae feed on some exudation either of the fungus or of the host plant.

Thrips (*Microcephalothrips*) *abdominalis* Crawford

Numerous on flowers of *Erigeron*, near Kiholo, July 7, 1945, F.A.B., coll.

Taeniothrips *gracilis* Moulton

Abundant in all stages and feeding heavily on leaves and stems of *Crinum* sp., Pololu Valley, June 28, 1944, F.A.B., coll.

I have found this species hidden within the unopened flowers of the same host plant at Halawa Valley, Molokai, where the thrips were apparently not numerous enough to hurt the plant. Heavy injury is accompanied by extensive reddish discoloration of the plant.

Taeniothrips *frici* (Uzel)

Numerous on flowers of *Hypochoeris radicata* Linn., Mauna Loa truck trail, H.N.P., February 25, 1945; one female on dead branch of *Acacia koa*, same locality, August 8, 1945; two females beaten off dead leaves of *Styphelia tameiameia* (Cham.) F. Muell., same locality, October 12, 1945; all collected by Mr. Davis.

Taeniothrips *cyperaceae* Bianchi

One female on leaves of *Vinca major* L., residential area, H.N.P., March 11, 1945, C.J.D., coll.

Frankliniella near *sulphurea* Schmutz

This is the species which was first found during August of 1942 and which has since become a predominant species on Oahu. I presume it is the same species listed by Sakimura as "*Frankliniella* sp." from the island of Hawaii (Proc. Haw. Ent. Soc., 12[2]: 329) but I cannot find a more specific reference to its presence on that island. For the sake of an unmistakable record, therefore, I note here that the species is found on Hawaii and that it is quite common on the lowlands, although it does not appear to have attained the predominant position it has on Oahu. Mr. Davis collected the species from flowers of *Lantana*, *Hibiscus*, and monkeypod at Keauhou, Kona, during May of 1945, and I had previously found it on other hosts in two localities of the island, both under 2,000 ft. elevation.